The American FERTILIZER

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1850—1949

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The American FERTILIZER

Vol. 110 APRIL 2, 1949 No. 7

Fertilizer Progress in Bizonal Germany[1]

By K. D. JACOB[2] and RALPH W. CUMMINGS[3]

JUST prior to World War II the Bizone—comprising the United States–United Kingdom military occupation zones of Germany (Fig. 1)—was dependent for about one-third of her food requirements on imports from abroad and on shipments from what are now the Soviet occupation and Polish administration areas of the Old Reich. Since 1939 the need for food in the Bizone has been intensified by a 25 per cent increase in population resulting largely from displaced persons and refugees, and by a large decrease in the Bizonal output of agricultural products. This situation has forced the occupation authorities to bring in huge quantities of food, at great expense to American and British taxpayers, in order to maintain even a bare subsistence ration. Though western Germany can never hope to grow enough food for her population even under the most favorable circumstances, it is essential, nevertheless, that her production of food be raised to the highest possible economic level. Adequate use of fertilizer is a very important factor in attaining this objective.

Conditions prevailing during and subsequent to the war have adversely affected soil fertility in the Bizone and have increased the need for fertilizer use beyond the prewar level. These conditions include (1) a very sharp decrease in the availability and use of fertilizers during the past 10 years, as shown by the data of Figs. 2 and 3 and Table I, (2) marked reduction in the livestock population (about 20%) and in the supply and quality of feedstuffs, with a corresponding reduction in the quantity and quality of the manure returned to the land, and (3) changes in the cropping pattern to produce more food, which placed a heavier drain on the soil resources and reduced the growing of soil-conserving crops. Another factor has been Germany's failure, during the Hitler regime and subsequently, to keep pace with the technical and scientific advances in agriculture.

Before the war the Bizone was practically self-sufficient in all types of fertilizers. Because of war-damage to fertilizer plants and other facilities and of the very adverse economic conditions prevailing in Germany since the close of the war, together with the general world shortage of fertilizer supplies, it has not yet been possible to bring the Bizonal use of fertilizer back to the pre-war level.

[1]This paper is based largely on a survey made in the Bizone during April, 1948 by the writers and Major T. C. Reddington, Office of the Food Administrator for Occupied Areas, Department of the Army. Publication approved by the Office of the Food Administrator for Occupied Areas.

Presented before the Division of Fertilizer Chemistry at the Meeting of the American Chemical Society, Washington, D. C., September 1, 1948.

[2]Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Maryland.

[3]North Carolina Agricultural Experiment Station, Raleigh, North Carolina.

Although some 170,000 tons[4] of plant food (nitrogen, P_2O_5, and K_2O) were imported into the Bizone in the year ended June 30, 1948, at a cost of more than $35,000,000 to the American and British taxpayers, the total supply of commercial plant food in that year was only 78 per cent of the consumption in 1938–1939 and 74 per cent of the 1947–1948 estimated requirement. This financial burden to the occupying nations and the prospect of a world shortage of fertilizers, especially nitrogen, for some time to come emphasize the need for expanding as rapidly as possible the Bizonal production of plant food to meet the area's requirements.

It is the purpose of this paper to review the progress in rehabilitation of the Bizonal fertilizer industry, to discuss the facilities for fertilizer manufacture, and to indicate the prospects for fertilizer production during the next three years.

[4]The metric ton is used throughout this paper.

Fertilizer Requirements

The estimated fertilizer requirements of thn Bizone for 1945–1946 to 1950–1951 are showe in Table I and Fig. 3. Prior to 1947–1948 the fertilizer requirements of the United States and the United Kingdom Zones were established independently and on different bases, which explains the inconsistencies in the nitrogen and P_2O_5 requirement figures for those years. The requirements for 1947–1948 are based on the 1947–1948 cropping plan and the estimated rates of use of plant food by crops in 1938–1939. The 1947–1948 requirements do not include any fertilizer for meadow and pasture lands, while the requirements for 1948–1949 are increased principally to provide fertilizer for these lands. In subsequent years, it is anticipated that fertilizer supplies will improve and, furthermore, that the German economy and agriculture will have recovered sufficiently to make possible the efficient distribution and use of the larger quantities.

Fig. 1. Military occupation zones of Germany

Fertilizer consumption in the Bizonal area in 1938–1939 is estimated at 303,400 tons of nitrogen, 352,300 tons of P_2O_5, and 529,200 tons of K_2O, quantities not much smaller than the 1947–1948 estimated requirements. Although data on fertilizer consumption in the Bizone during the war are not available it is safe to assume that the curtailment in use was similar to that in Germany as a whole (*43*, *44*)* (Fig. 2). This situation, together with the relatively small postwar use of fertilizers (Table 1), the reduced supply of animal manures, the decline in crop yields, and other things, heavily supports the view that soil fertility in the Bizone has suffered a substantial decline during the past 10 years.

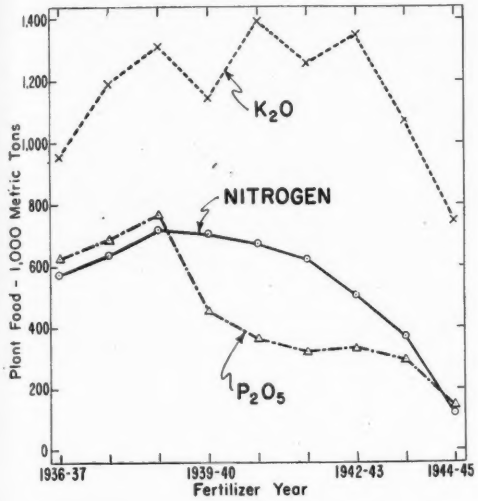

Fig. 2. Consumption of commercial plant food in Germany (Old Reich), 1936-1937 to 1944-1945

The principal effects of nitrogen are obtained in the year in which it is applied. However, reduction in the use of nitrogen has undoubtedly been a factor in the decreased yields of grain and straw and perhaps of pasture and hayland, and to this extent it reduced the amount of manure produced and returned to the land. This would be expected to contribute to deterioration in the soil-humus supply. As supplies of phosphate fertilizer have been very sharply curtailed for a

*Figures in italics refer to literature cited at the end of the paper.

TABLE I. SUMMARY OF FERTILIZER STATISTICS FOR THE BIZONE[1]

Fiscal Year[2]	Requirement, Tons	Plant Capacity, Tons	Production			Imports, Tons	Exports, Tons
			Quantity, Tons	Portion of Requirement, %	Portion of Plant Capacity, %		
			Nitrogen—100% N				
1945–46.....	303,000	([3])	50,000	16.5	....	4,000	0
1946–47.....	280,000	([3])	125,000	44.6	....	40,700	0
1947–48.....	320,000	243,000	165,000	51.6	67.9	77,000	0
1948–49.....	345,000	294,000	230,000	66.7	78.2	.....	...
1949–50.....	375,000	339,000	290,000	77.3	85.5	.....	...
1950–51.....	400,000	392,000	340,000	85.0	86.7	.....	...
			Phosphate—100% P_2O_5[4]				
1945–46.....	347,000	([3])	42,000	12.1	....	0	0
1946–47.....	400,000	([3])	97,000	24.3	....	20,000	0
1947–48.....	360,000	165,500	125,000	34.7	75.5	80,700	0
1948–49.....	414,000	250,000	200,000	48.3	80.0	.....	...
1949–50.....	450,000	286,100	242,000	53.8	84.6	.....	...
1950–51.....	480,000	327,900	288,000	60.0	87.8	.....	...
			Potash—100% K_2O				
1945–46.....	559,000	([3])	196,000	35.1	....	0	[5]4,000
1946–47.....	560,000	([3])	296,000	52.9	....	0	[5]3,000
1947–48.....	574,000	562,000	410,000	71.4	73.0	12,900	34,100
1948–49.....	620,000	609,000	500,000	80.6	82.1	.....	...
1949–50.....	675,000	665,000	565,000	83.7	85.0	.....	...
1950–51.....	720,000	752,000	675,000	93.8	89.8	.....	...

[1]The data relate only to finished fertilizer products. They do not include nitrogen, P_2O_5, and K_2O for technical and industrial use.
[2]Ending June 30.
[3]Not available.
[4]Plant capacity and production do not include ground raw phosphate rock for direct application to the soil. Imports relate only to processed phosphates and do not include raw phosphate rock.
[5]Estimated.

good many years, there is no question that the P_2O_5 content of the Bizonal soils in general has declined well below the level needed for maximum crop production. Historically, Germany has been a heavy user of potash, and compared with the prewar consumption her use of this material has remained at a much higher level than that of either nitrogen or phosphate. Taking the situation as a whole, it appears that nitrogen has been the plant food most seriously limiting crop production in the Bizone, followed in order by P_2O_5 and K_2O.

Level of Industry Plan

The original Level of Industry Plan for Germany[5] specified large decreases in the plant prewar capacity for manufacture of nitrogen and phosphate fertilizers but imposed no restrictions on potash production (*3, 50, 84, 86*). As regards fertilizers the plan is stated briefly as follows (*84*):

> "With respect to fertilizers, the plan envisages over 100 per cent of prewar production of potash, but cuts nitrogen and phosphate capacity to 40 per cent of the 1936 capacity because these chemicals are important in the manufacture of munitions. For this reason two of the three chief fertilizers will have eventually to be supplied in large measure by imports. The plan allows retention of capacity for making nitrogen through the synthetic ammonia process until necessary imports of nitrogen can be secured and paid for."

At the same time, it was specified that in the basic chemical industries there would be retained 40 per cent of the 1936 productive capacity, measured by sales in 1936 values. Besides nitrogen and phosphate, this group included calcium carbide, sulfuric acid, and soda ash, all of which are essential to manufacture of fertilizers in Germany. By January, 1947 the plan had been modified with respect to certain items in the basic chemicals group, for example, to permit retention of 70 per cent of the war-end capacity for sulfuric acid (*50*).

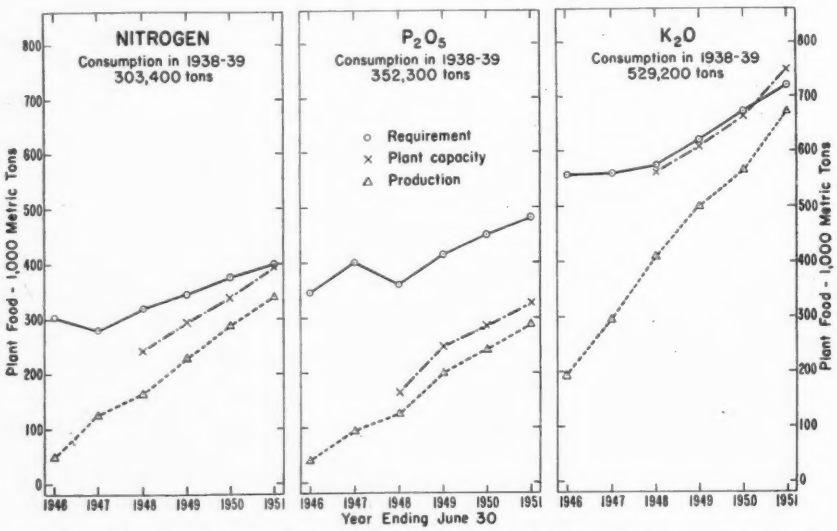

Fig. 3. Requirement, plant capacity, and production of plant food in the Bizone, 1945-1946 to 1950-1951

Under the original plan, the productive capacity of the steel industry to be left in Germany was placed at 7,500,000 ingot tons (about 40 per cent of the 1936 capacity), while the allowable production of steel was set at 5,800,000 ingot tons annually, with the provision, however, that the latter figure would be subject to annual review by the Allied Control Council and might be increased with the specific approval of the Council. As production of basic slag, by far the most important phosphate fertilizer manufactured and used in prewar Germany, is inseparably

(Continued on page 28)

[5]The development of the industry-level and reparations plans is ably discussed by Ratchford and Ross (*75a*).

Prominent Speakers to Address Convention of American Plant Food Council

Rep. Harold D. Cooley (D-N. C.), chairman of the House Agricultural Committee, will be among the major speakers at the fourth annual convention of the American Plant Food Council at The Mount Washington Hotel, Bretton Woods, N. H., June 19–22, Clifton A. Woodrum, president of the Council, has announced.

Other speakers on the program will include well-known soil scientists, Government agricultural leaders, educators and National 4–H Club leaders.

Rep. Cooley will speak at the Council's annual banquet at 7:30 P. M., June 21.

The business session of the convention June 20 will begin with an address by the Council's president, followed by an agricultural panel on "Fertilizer, Farming and the Future" with Dr. Paul D. Sanders, Richmond, Va., editor of "The Southern Planter" and immediately past president of the American Agricultural Editors' Association, as moderator.

Other panel speakers will include Rep. Charles B. Hoeven (R-Iowa), member of the House Agriculture Committee; Dr. Robert M. Salter, chief, Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md., and Dr. Robert F. Chandler, Jr., director, New Hampshire Agricultural Experiment Station and dean, College of Agriculture, University of New Hampshire at Durham.

Dr. William I. Myers, Dean of Agriculture, State College of Agriculture, Cornell University, Ithaca, N. Y., will be the principal speaker on the morning program, June 21.

Following Dr. Myers, talks will be heard by Francis Pressly of Stony Point, N. C., and Miss Rita Bott of Triadelphia, W. Va., two national leaders in 4-H Club work.

J. A. Howell, executive vice-president of the Virginia-Carolina Chemical Corporation, Richmond, Va., is chairman of the Convention Committee which includes C. B. Robertson, president, Robertson Chemical Corporation, Norfolk, Va., and Fred J. Woods vice-president, Gulf Fertilizer Company, Tampa, Fla.

Chairmen of other committees are: Hospitality, G. Tracy Cunningham, Asst. General Sales Manager, Armour Fertilizer Works, Atlanta, Ga.; Golf, Albert B. Baker, Jr., Bradley & Baker, New York City and Ladies,' Mrs. Albert B. Baker, Sr., New York City.

The Mount Washington Hotel, located on a 10,000-acre estate amidst the Presidential Range, will accommodate approximately 500 persons and the entire facilities of the hotel will be available to the Council members and their guests during the convention period. The facilities include an 18-hole championship golf course, outdoor swimming pool, tennis courts and many other features for comfort and enjoyment.

Outstanding talent is being obtained for the entertainment features of the program.

While the Council has engaged the hotel for four days, June 19 to 22 inclusive, the hotel management has agreed to accommodate those who desire to arrive on Saturday, June 18th, insofar as possible. As another convention will be using the hotel facilities on June 16, 17 and 18, those who plan to arrive before June 19th should check their reservations with the Mount Washington.

The Council has arranged for a special train to Bretton Woods, which will leave New York on Saturday evening, June 18, about 9 P. M., arriving at the hotel Sunday,

(Continued on page 26)

EXECUTIVE COMMITTEE OF AMERICAN PLANT FOOD COUNCIL

Members of the American Plant Food Council's Executive Committee, who had leading roles in planning the 1949 Convention to be held at The Mount Washington Hotel, Bretton Woods, N. H., June 19-22, are, (left to right) bottom row: Paul Speer, vice-president, U. S. Potash Company, New York City; Fred J. Woods, vice-president, Gulf Fertilizer Company, Tampa, Fla., chairman; A. F. Reed, vice-president, Lion Oil Company, El Dorado, Ark.; top row, W. T. Wright, vice-president, F. S. Royster Guano Company, Norfolk Va.; C. B. Robertson, president, Robertson Chemical Corporation, Norfolk and Robert C. Simms, president, Naco Fertilizer Company, New York City

THE AMERICAN FERTILIZER

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Vol. 110 APRIL 2, 1949 No. 7

Principal Articles in This Issue

Potash Production in 1948 Breaks Records

Deliveries of potash in North America continued their upward trend during 1948, when the five leading producers and three importers delivered 2,202,036 tons of potash salts containing an equivalent of 1,173,842 tons K_2O. This was an increase of 82,818 tons K_2O or 7.6 per cent over 1947. European potash salts of French and German origin totaling 69,455 tons of salts, with an equivalent of 40,069 tons K_2O, delivered in the United States and Canada are included in these figures. Importations of potash of Russian origin are not included.

Deliveries for agricultural purposes in the continental United States for 1948 were 977,381 tons K_2O, an increase of 79,231 tons over 1947. Canada received 62,198 tons K_2O, Cuba 3,982 tons, Puerto Rico 19,471 tons, and Hawaii 9,153 tons. Exports to other countries amounted to 13,631 tons K_2O.

In this country the potash was delivered in 45 states and the District of Columbia. Georgia and Ohio were practically tied for the leading position in deliveries of agricultural potash at about 88,550 tons K_2O, followed in order by Illinois, Virginia, North Carolina and Florida, each taking more than 60,000 tons K_2O during the year. Due to shipments across state lines consumption does not necessarily correspond to deliveries within a state.

The 60 per cent muriate of potash continued to be by far the most popular material, comprising 79 per cent of the total K_2O delivered for agricultural purposes. The 50 per cent muriate of potash made up 7 per cent of the total, manure salts 6 per cent, and sulphate of potash and sulphate of potash magnesia 8 per cent. This was about the same pattern of distribution as in 1947.

Deliveries for chemical purposes in 1948 were 132,787 tons of muriate of potash containing an equivalent of 83,353 tons K_2O and 9,301 tons of sulphate of potash containing 4,673 tons K_2O. The total chemical deliveries of 88,026 tons K_2O were 5,319 tons or 6 per cent more than in 1947.

In the fourth quarter of 1948 deliveries totaled 620,308 tons of salts containing an equivalent of 330,909 tons K_2O, an increase of 3 per cent compared to K_2O deliveries in the same 1947 period. The continental United States received for agricultural purposes 265,509 tons K_2O, Canada 34,204 tons, Cuba 1,324 tons, Puerto Rico 2,500 tons, and Hawaii 1,627 tons. Exports to other coun-

tries were 3,763 tons K_2O. The Canadian figure for the quarter is abnormally high since it includes deliveries of French potash during the entire year.

Chemical deliveries during the fourth quarter amounted to 35,689 tons of salts containing an equivalent of 21,981 tons K_2O, compared to 21,692 tons K_2O in the same period in 1947. Of the 1948 total, muriate of potash equivalent to 20,471 tons K_2O and sulphate of potash equivalent to 1,378 tons K_2O were delivered in the United States and 133 tons K_2O as muriate in Canada.

POTASH DELIVERIES

	Short Tons K_2O	
AGRICULTURAL	1948	1947
United States		
Muriate 60 per cent.	761,696	714,389
Muriate 50 per cent.	72,009	67,714
Manure Salts	67,136	45,003
Sulphate and Sul. Pot-Mag.	76,540	71,044
Total	977,381	898,150
Canada	62,198	39,205
Cuba	3,982	4,811
Puerto Rico	19,471	21,293
Hawaii	9,153	13,183
Total Institute Territories	1,072,185	976,642
Other Exports	13,631	11,920
Total Agricultural	1,085,816	988,562
CHEMICAL		
United States		
Muriate 60 per cent.	82,873	79,494
Sulphate of potash	4,673	2,573
Total	87,546	82,067
Canada		
Muriate 60 per cent	480	639
Total Chemical	88,026	82,706
Grand Total	1,173,842	1,071,268

Mathieson Takes Over Operation of Acquired Companies

At the annual meeting of the stockholders of Mathieson Chemical Corporation, Thomas S. Nichols, president and chairman of the board, reported that the company would take over on April 1st the operations of the Standard Wholesale Phosphate and Acid Works and the Southern Acid and Sulphur Co., both of which companies had been recently purchased by the Mathieson concern. On that day, the transfer of stock by which Mathieson acquires the assets of these companies will be effected.

It has been decided, Mr. Nichols stated, to to discontinue the names of both of the acquired companies immediately and to conduct all activities in the name of Mathieson Chemical Corporation.

The directors elected are Howard Berry, H. Donald Campbell, Arnold B. Chace, John P. Chase, J. C. Leppart, Thomas S. Nichols, Sinclair Richardson, Robert C. Stone, and A. P. Winsor.

Program Shaping Up for N. F. A. June Convention

Members and guests including representatives of agriculture and industry from all over America, as well as Canada, are planning to attend The National Fertilizer Association's 24th Annual June Convention at the Greenbrier Hotel, White Sulphur Springs, West Virginia, June 13–15.

Although the program has not been fully completed, the following nationally known leaders have already accepted the Association's invitation to address the convention: Louis Bromfield, Lucas, Ohio, author of *Malabar Farm*, and many other volumes on agriculture; Charles H. Mahoney, director, National Canners Association, Washington, D. C., and John H. Davis, secretary, National Council of Farmer Cooperatives, Washington, D. C. Ray King, Valdosta, Ga., chairman of the Association's Board of Directors and Russell Coleman, president of the Association, will also speak.

The annual June meeting of N.F.A. Board of Directors will be held on Monday morning, June 13, and the general sessions of the convention will be held in the mornings of the following two days. The annual dinner is scheduled for Tuesday evening, June 14.

Sports contents including golf, tennis, and horseshoe pitching have already been arranged with the following chairmen: Committee on Golf, A. L. Walker, Jr., Texas Gulf Sulphur Co., New York City; Committee on Ladies' Golf Events, Mrs. J. E. Totman, Baltimore, Md.; Committee on Tennis, James C. Totman, Summers Fertilizer Co., Bangor, Me., and Committee on Horseshoe Pitching Contest, A. A. Schultz, Reading Bone Fertilizer Co., Reading Pa.

Canadian Fertilizer Producers to Hold June Meeting

The annual convention of the Plent food Producers, Ontario, will be held at the Manor Richelieu, Murray Bay, Quebec, on June 28th, 29th and 30th. An invitation is extended to all fertilizer manufacturers to attend these sessions. Further details may be obtained by writing to A. Mooney, Secretary, Plantfood Producers, Toronto, Ontorio.

February Tag Sales

Fertilizer tax tags were sold in greater quantity last month than in any month since March 1937. The number of tags sold, according to reports submitted to The National Fertilizer Association by control officials in the 14 States which require the use of the tags, was sufficient to cover 1,465,000 short tons of fertilizer or 13 per cent more than in January and 28.5 per cent more than during the previous February. Sales during January had been considerably lower than those of the same month last year, but the unusually high showing made in February resulted in a 2-month total of 2,758,000 tons, which was about 7 per cent higher than last year's 2,570,000 tons.

Of the ten Southern States, only Texas and Oklahoma sold fewer tags last month than in January; each of the remaining States increased its equivalent tonnage by percentages ranging from 3 per cent in North Carolina to 81 per cent in Alabama. Comparison of January-February totals in the Southern States shows an increase of approximately 8 per cent in aggregate sales over those of a year ago, and increases in 6 of the individual States. The largest tonnage increase, 143,000, was that reported by North Carolina whose sales of 624,000 equivalent tons during the 2-month period were greater than those of any other State. The largest percentage gain was that reported by Arkansas, which almost doubled last year's January-February tonnage with sales covering 67,000 tons. The Southern States as a group accounted for over 83 per cent of all tag sales during the past 2 months, showing

(Continued on page 26)

FERTILIZER TAX TAG SALES
Compiled by The National Fertilizer Association

State	February 1949 Tons	February 1948 Tons	February 1947 Tons	February % of 1948	January-February 1949 Tons	January-February 1948 Tons	January-February 1947 Tons
Virginia	107,683	71,259	71,736	119	198,450	166,665	165,350
N. Carolina	316,618	168,652	259,504	130	623,946	480,886	581,722
S. Carolina	197,580	166,186	130,270	103	371,034	360,931	325,165
Georgia	234,801	189,500	214,800	88	366,496	415,711	415,390
Florida	124,780	100,835	70,703	129	240,573	185,843	167,936
Alabama	159,991	167,671	120,150	85	248,076	290,778	287,350
Tennessee	36,666	34,305	38,475	98	62,895	63,872	78,040
Arkansas	37,834	20,095	39,200	199	66,610	33,536	64,800
Texas	41,175	25,250	55,765	98	91,143	93,073	98,839
Oklahoma	9,550	18,103	12,550	69	27,900	40,162	25,900
Total South	1,266,678	961,856	1,013,153	108	2,297,123	2,131,457	2,210,492
Indiana	37,161	50,805	46,527	84	133,693	159,808	127,114
Kentucky	92,380	58,127	49,000	125	180,735	144,731	116,253
Missouri	48,425	60,035	36,130	110	116,306	106,063	63,020
Kansas	19,904	8,750	10,810	110	30,179	27,540	19,598
Total Midwest	197,870	177,717	142,467	105	460,913	438,142	325,985
Grand Total	1,464,548	1,139,573	1,155,620	107	2,758,036	2,569,599	2,536,477

FERTILIZER MATERIALS MARKET

NEW YORK

Resumption of Coal Mining Welcomed by Sulphate of Ammonia Producers. Better Demand for Organic by Both Feed and Fertilizer Trade. Spot Fish Meal Reaches Near Record Figure. Bone Meal Very Scarce. Superphosphate and Potash Shipments Satisfactory

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, March 30, 1949.

Sulphate of Ammonia

It was feared for a time that the coal shutdown might effect the production of this material, but now that the men in the coal mines have gone back to work, a regular production schedule is looked for. No further price changes have been reported.

Nitrate of Soda

Domestic producers were said to have increased their production of this material and a better supply situation is looked for shortly. Importers continue to ship material as fast as steamers arrive from Chile.

Ammonium Nitrate

One large western producer was shut down for about ten days due to a strike, but this has now been settled and production has started. Demand continues in excess of supply.

Nitrogenous Tankage

No price changes were reported and a better demand was noted. Shipments are going ahead mostly on old contracts.

Organics

With the seasonal movement of mixed fertilizer well under way, there was a better demand for organic fertilizer materials and the feed trade showed considerable interest for nearby delivery. Tankage and blood were well sold up, with last sales at $8.00 per unit of ammonia ($9.72 per unit N) f.o.b. shipping points. Cottonseed meal for quick shipment was firm in price but soybean meal showed some weakness from time, with the market nominally around $56.00 per ton in bulk, f.o.b. Decatur, Ill. Linseed meal was slightly easier in tone with some price shading reported. Feed manufacturers have let their inventories run rather low, with the result that when they need material for quick shipment, they have to bid for it.

Castor Pomace

With producers sold up for some time ahead and not offering, this market has assumed a firmer position and material for quick shipment is hard to locate. Last sales were on the basis of $24.00 per ton.

Hoof Meal

This material is not too plentiful and is sold as it comes on the market at a steady price of about $7.00 per unit of ammonia (8.51 per unit N) f.o.b. shipping points.

Fish Meal

While the new fishing season has not as yet opened up, a good-sized quantity of fish scrap has been reported sold on a "when and if made" basis. Sales of fish meal for quick shipment have been made at over $200.00 per ton, which is a near record figure. This material is moving entirely to the feed trade.

Superphosphate

This material is available from most shipping points, although certain areas in the southern states report temporary shortages for quick shipment. No price changes have been reported.

Potash

Some easing in the demand for this material is looked for as soon as the present fertilizer season is over and it is generally conceded the supply and demand are getting more evenly balanced. No further shipments of imported material were noted.

Bone Meal

This material is practically impossible to obtain for either prompt or nearby shipment.

The production has been curtailed and the demand from the feed trade increased tremendously, with the result that a good many buyers have found themselves unable to supply their trade. No relief is looked for for some time.

CHARLESTON

Fertilizer Demand Reaching Peak. Sectional Shortage of Superphosphate. Some Spot Potash on Market. Urea Price Increased

CHARLESTON, March 28, 1949.

Nitrogen continues short of demand. Superphosphate is moving in seasonal dimensions with shortages developing in the southeast and in certain sections of the mid-west. Potash movement is on schedule with producers taking orders for the spot period beginning April 1st. Demand for fertilizers on the part of the famer is at its peak in the southeast and increasing in the northeast.

Organics.—There were practically no changes of prices in organics during the past week as interest has remained relatively quiet. Nitrogenous tankage is offered at $3.00 to $4.00 per unit of ammonia ($3.64 to $4.86 per unit N), in bulk f.o.b. production point, depending on the location of the producer. Although, generally, imported organics are above buyers' ideas of price, a little bone meal has been sold for shipment to this country, at around $66.00 c.a.f. Atlantic port.

Castor Pomace.—Producers are in a sold-up condition, the last sales being negotiated at $21.00 f.o.b. northeastern shipping points. Movement now is against current contracts.

Dried Ground Blood.—Interest is slack, but blood recently sold at $8.00 per unit of ammonia ($9.72 per unit N), in bulk, f.o.b. New York area. The Chicago market is around $7.75 per unit of ammonia ($9.42 per unit N).

Potash.—Shipments from one producer temporarily were suspended but the movement continues on schedule. Orders are being taken for the spot period beginning April 1st, with demand stronger than the available supplies.

Phosphate Rock.—Supplies continue adequate to meet the domestic and export demand, with movement primarily to contract customers. March movement is above shipments made in February.

Superphosphate.—Shortages are developing in certain sections of the south and the market is firm. Movement is described at full seasonal dimensions at the present time

Sulphate of Ammonia.—Demand continues far in excess of supply and the price range is between $45.00 and $48.00 per ton in bulk, f.o.b. production points. No easement in the tight supply situation is expected for the balance of this season.

Urea.—The new price effective April 1st will be 4½ c. per pound on crystal urea. This is an increase of ¼c. per pound and there will be a comparable increase in the price of urea fertilizer compound, of which urea is a principal component.

Ammonium Nitrate.—Demand continues heavy with supply insufficient to meet the call. No recent change in prices has been noted.

CHICAGO

Ammoniate Market Strong and Well-Balanced. Some Price Increases Reported

CHICAGO, March 28, 1949.

The market on animal ammoniates continues in a strong position although buying interest is still confined to nearby shipments. Producers are keeping a well sold-up position so that the market is quite well balanced from a supply and demand standpoint.

Digester tankage has advanced recently to

$110.00 per ton, sacked, f.o.b. shipping points. Meat scraps are also quoted at this figure but in at least one instance the price has been advanced $3.00 per ton.

Dry rendered tankage is steady at $2.00 per unit of protein delivered. Wet rendered tankage is listed $7.75 to $8.25 per unit of ammonia ($9.42 to $10.02 per unit N), depending upon quality and location.

Dried blood ranges from $7.75 to $8.00 per unit of ammonia ($9.42 to $9.72 per unit N). Steamed bone meal $70.00 to $75.00 per ton and raw bone meal $65.00 to $70.00

PHILADELPHIA

Smaller Mixed Tonnage Expected. Demand for Materials Slackens. Chemical Nitrogen Still Scarce. Superphosphate Shipments Improve

PHILADELPHIA, March 29, 1949.

The season is now well under way and the demand for raw materials is quite slack. Bone meal is still very scarce, but other organics are much easier, with no pressure to sell and not much demand. It is still expected that the total consumption of complete fertilizers will be less this season than last.

Sulphate of Ammonia.—The supply is still inadequate to meet requirements, although demand is not quite so urgent. Market position remains firm and tight.

Nitrate of Soda.—Demand continues somewhat ahead of the supply, though Chilean is arriving on schedule and distribution of domestic grade is reported materially increased.

Ammonium Nitrate.—The market position remains definitely tight, with greater demand than supply.

Castor Pomace.—Shipments are now principally against contracts, practically all of the recent surplus having been disposed of.

Blood, Tankage, Bone.—The market has been without activity in blood and tankage and price range remains at $7.00 to $7.50 per unit of ammonia ($8.51 to $9.12 for unit N), with trading quite limited. Bone meal is very scarce with production practically all under contract.

Fish Scrap.—No spot business reported but 60 per cent menhaden meal for June-July is quoted at $135.00 per ton, with scrap at $125.00.

Phosphate Rock.—Shipments are confined mostly to contract consumers and the supply now seems ample to meet all requirements.

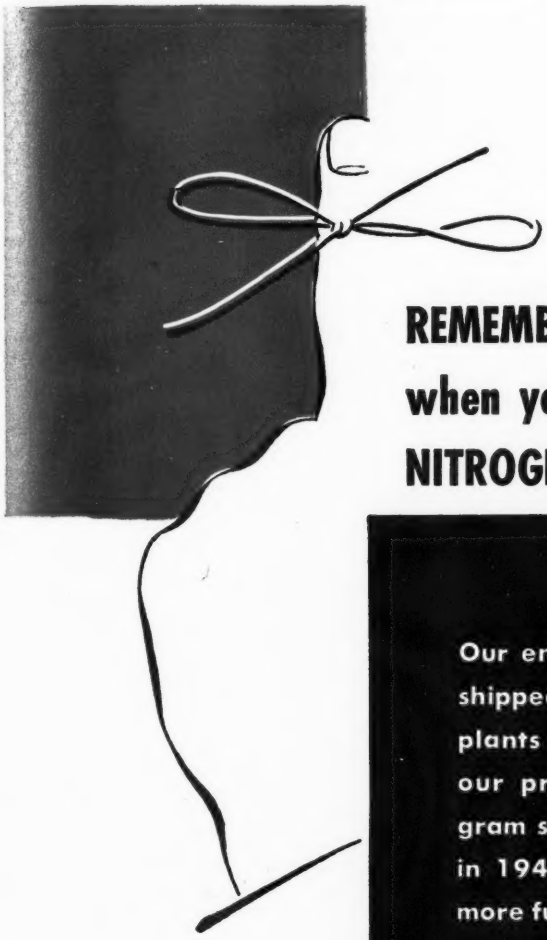
Superphosphate.—There is quite an improvement in the demand and shipments are moving out in greater volume. No price changes are reported.

Potash.—Contract shipments are reported up to schedule and production is gradually increasing. An arrival from Europe is expected at Norfolk shortly.

Record World Nitrogen Production Indicated

A revised table of recommended distribution of nitrogenous fertilizers for 1948–49 (July-June), incorporating all changes in production and distribution made during the past eight months by the IEFC Committee on Fertilizers, has been issued for informational purposes.

The revised table indicates a record world (excluding USSR) production of 3,160,000 metric tons during the year, compared with an October estimate of 3,060,000 metric tons, and a production of 2,731,000 metric tons during 1947–48. The increase over the estimate made in October is accounted for mainly by larger production than anticipated in the United States and Japan and Austria.



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Our entire production is being shipped exclusively to fertilizer plants in the deep South, and our present expansion program scheduled for completion in 1949—should enable us to more fully meet your needs for:

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- Sulphate of Ammonia
- Ammonium Nitrate Fertilizer
- Anhydrous Ammonia

Chemical Division
LION OIL CO.
El Dorado, Arkansas

Technical service available to fertilizer manufacturers

LION

The indicated increase in distribution above precious estimates made last summer is due primarily to changes in indigenous production and more complete accounting of ordnance production, plus the utilization of part of an unallocated balance held in reserve.

Reductions in recommended imports to some countries result from preferences for certain types of fertilizers and from currency and monetary problems. These reductions have been made in spite of continuing heavy needs for nitrogenous fertilizers for food production.

A small unallocated balance continues to be held in reserve because exact production is still uncertain. Recommendations for the distribution of the unallocated tonnage will be made when more definite information concerning total production is known.

The principal producing countries (in thousands of metric tons N) are: United States, 936; Chile, 281; Japan, 265; United Kingdom, 261; Germany-Bizonal, 221; Germany-French zone, 65; France, 181; Belgium and Luxenbourg, 178; Canada, 167; Italy, 150; Norway, 110; Netherlands, 80; Austria, 73; Poland, 55.

Chase Names Ayers Toledo Sales Manager

The transfer of R. H. Ayers from the Detroit Sales Office of Chase Bag Company to the position of Sales Manager of the company's Toledo branch has been announced by R. N. Conners, Chase Vice-President and General Sales Manager.

Mr. Ayers, with the exception of his wartime service in the U. S. Coast Guard, has represented Chase in the Detroit area since 1939. His new assignment will include the direction of sales in the entire state of Ohio and parts of Michigan, Indiana, and West Virginia, with headquarters in Toledo.

British Fertilizer Industry Forms Research Association

At a recent public meeting in London, England, leading members of the superphosphate and compound fertilizer manufacturing industries agreed to form a Fertilizer Research Association under the industrial research association schemes of the Department of Scientific and Industrial Research.

The meeting appointed a Formation Committee to draw up a Memorandum and Articles of Association, to discuss with the Department of Scientific and Industrial Research the financial and other aspects of Government participation in the project and generally to give effect to the decisions of the meeting.

Price Support on Pasture Seed Production

A price support program to encourage increased production of hay, pasture and range grass seed in expectation of greater need for such seed during the next few years for planting on some of the acreage now in wheat, cotton, and other cash crops was announced on March 21st by the Production and Marketing Administration, U. S. Department of Agriculture.

The hay and pasture seeds include alfalfa, various kinds of clovers, lespedeza and several grasses. Range grass seeds include buffalo grass, switch grass, bluestem, lovegrass and Indian grass. Price supports, to be operative through purchase agreements with farmers, range from nominal sums on hay and pasture grasses to $1.25 a pound for certified Ladino clover.

The Department stated that domestic supplies of many of the seeds are low, and that even without a potentially greater need, increased production is desirable. In event of a gradual reduction in cereal, fiber, and oilseed production, it was stated, substantial quantities of hay, pasture and range grass seed will be needed to conserve and improve the released acreage.

The program applies to seed produced in 1949. The support prices for each variety will be the rates shown on the schedule, subject to appropriate discounts for seeds which do not meet the basic specifications, or 90 per cent of parity (or comparable price) as of July 1, 1949, whichever is lower.

In the field, the program will be operated through State PMA and county agricultural conservation committees from whom interested producers may obtain additional information.

New N. F. A. Pamphlet

The National Fertilizer Association is preparing a new attractive 16-page pamphlet, entitled "Protein Through Forage." Illustrated with seven full-page photographs, this booklet contains suggestions on raising quality forage with high protein content in order to produce healthier livestock.

Farm Production and Income in 1948

Although agricultural production for sale and home consumption, and farmers' gross income and cash receipts were all higher in 1948 than in any previous year, farmers' realized net income, because of increased production expenses, was somewhat below that of 1947. Cash receipts last year, according to preliminary estimates of the Bureau of Agricultural Economics, amounted to about $31 billion, or three per cent more than in 1947; this increase reflects slight net rises in both prices and production. Receipts from the sale of crops amounted to about $13.6 billion, which, despite a ten per cent increase in production, was slightly under the 1947 figure as a result of a four per cent decrease in prices.

The volume of production of all agricultural commodities, as shown by index numbers prepared by BAE, was 138 per cent of the 1935–39 average as compared with 136 per cent in 1947. Livestock and products showed a four per cent decrease from 1947 production figures; crop production, by contrast, was at an all-time high—almost 50 per cent greater than the base period average. This record was the result of especially large production of feed crops, cotton, oil crops and vegetables, which showed respectively 44, 25, 20 and 13 per cent increases over 1947 production figures. Exceptionally high yields were reported for flaxseed, soybeans, potatoes and dry edible beans.

Nitrogen Hungry o· 'itrogen Starved?*

BY DR. R. H. BRAY

Department of Agronomy, Illinois Agricultural Experiment Station

IF YOU wait until plant-nutrient deficiency symptoms develop to warn that your crop is deficient in nitrogen or any other nutrient, it is like locking the stable after the horse is stolen.

Once the yellow-green to orange-yellow symptoms develop, the plant is not just hungry—it is starved. Its growth has been held back and its tissues have been damaged. Its yield has been decreased. But if you can catch this development in the hungry stage, you may be able to side dress the nutrient needed, and prevent or modify the deficiency.

We found a severe potash deficiency in a corn field the first week in July. The farmer side dressed potash on part of it, but only partially brought the corn out of it. Both potash and phosphorus are nutrients which cannot be used effectively enough after the plant comes up. That is why we use soil tests for these nutrients. Tissue tests for potassium and phosphorus are more like post-mortems.

Nitrogen, however, is a nutrient which can be added to bring a plant fully out of a deficiency when it is caught in the hungry stage. Thus, we recommend a regular program of testing for nitrates in the plant tissue.

We now have a white nitrate test powder which can be carried in a tube in the shirt pocket, ready for use as a farmer walks through his field. Checking on this plant and that plant as he goes over his farm every two weeks, he can easily find when the crop is starting to get hungry for nitrogen. If, when he places a little of the powder on the cut tissue, the powder turns pink to red as the sap mixes with it, the plant is *not* nitrogen hungry. If the powder remains white, the

*Reprinted from "Victory Farm Forum," March, 1949, published by Chilean Nitrate Educational Bureau, New York.

plant *is* nitrogen hungry. By making regular tests throughout the season, nitrogen starvation can be prevented. With corn, leaf symptoms of starvation do not start to show up until ten days to two weeks after the test shows the plant is hungry. Side dressing with a soluble nitrogen fertilizer can readily prevent starvation. However, there are two types of interpretation. First, if the hunger shows up while there is still time to side dress the crop, the nitrogen deficiency can be avoided. Second, if the nitrogen deficiency shows up late in the season, it may be too late to avoid the deficiency, especially if the ground is dry and no rain carried the applied nitrogen into the soil.

But in either case, the finding of the deficiency is a sign that the farmer's nitrogen program is entirely inadequate. It is a sign that next year's crop should be started out with more nitrogen. If legumes are in the rotation, it is a sign that the legume program is inadequte and should be supplemented with fertilizer nitrogen.

Testing Corn

For testing corn, we recommend that the lower part of the stalk be tested. We have found that as nitrogen starts to become scarce in the soil, the upper leaves are the first to show a white (negative) test. Then the sap of the upper stalk, followed by the lower leaves, becomes low in nitrate nitrogen. The lower stalk tests pink longer than any other part of the plant. But we do not consider the plant really hungry until the whole plant tests white, because a white test in the upper part of the plant may be only a temporary condition.

In testing, we cut into the stalk and bend out the cut part. A thin layer of powder is applied to the pith and the cut part is squeezed against the pith for one minute. The color developed is recorded in terms of white, slight pink, pink, red, and deep red.

Another method is to cut off the stalk and split it up the middle, apply a layer of powder and then press together again. Or, a small amount of the powder can be applied to the mid-rib of a leaf, which is then folded to crack the rib at the point where the powder was placed. It is then squeezed so that sap will mix with the powder. This is the quickest test to use, and only if the result is negative, do we test the lower stalk.

With other plants, we break off the succulent growing tips, dust powder on the exposed surface, and then squeeze the stem near the break until the sap wets the powder. Or if the tissue is too dry, we cut it up into small pieces and to one part (by volume) of the cut tissue in a tube we add one part of powder and seven parts of nitrate free water (water which does not turn pink when the powder alone is added to it). This is shaken for 20 seconds and allowed to settle. Again a pink solution shows nitrates are present. With grass or other fine materials, the clippings can be placed between a folded filter paper, the powder added, and the paper squeezed with a pair of pliers. This produces enough sap to turn the paper pink if nitrates are present.

Soil Testing

As a soil test, one part of soil, one part of the powder, and seven parts of water are shaken for 20 seconds and allowed to settle. But a soil test has no value except when it is positive. In the spring before the crop gets under way and uses up the available nitrogen, the soil test can show how much nitrate nitrogen has accumulated. But after the crop gets going, a negative test has no meaning. We can grow 100 bushels of corn in Illinois without once finding a good positive test for nitrate in the soil after the crop is knee high. The organic matter in the soil may be releasing enough for 100 bushels of corn, yet the plants will be taking it up about as fast as it is being changed into the available nitrate form. The plant will test pink or red but the soil will test white. This is another reason we prefer tissue tests for nitrogen—the soil test does not always tell the story. One warning should be given. While the soil is wet and soggy, the plant may test low in nitrate during that period, yet plenty of nitrate might become available later when the soil dries out.

Under the Illinois program, nitrogen is the only nutrient which cannot be controlled over a long time period by soil tests. We test for

limestone (calcium and magnesium) needs, phosphate needs, and potash needs. Then we can build up the soil levels of the available forms as high as needed and maintain these nutrients at the required levels. This is controlled by only occasional testing. But nitrogen is another story. There is no form of soil nitrogen which is both an available form and a storage form, as is the case with the other nutrients. Hence, each year nitrogen becomes a new problem. Is there enough for the crop which that season can produce? Has enough been added to take care of that higher rate of planting? Is the amount present so high that more should not be added?

Take the case of a lawn or a vegetable crop. Best results might be obtained by controlling the nitrogen. In such cases nitrogen is not added as long as the tissue tests pink. But as soon as a very light pink or white is found, more soluble nitrogen is added—but in small amounts. The nitrate content of greenhouse crops and crops under irrigation can be easily controlled in this way. Some of the best golf greens we have ever seen have had the nitrogen applications controlled by testing the clippings with the powder and adding only very small amounts of nitrogen at one time, but making sure nitrogen never becomes deficient.

The directions for making the powder are to be found in Soil Science, Vol. 60, No. 3, September, 1945, under the title, "Nitrate Tests for Soils and Plant Tissues" by Roger H. Bray.

The tubes of powder are obtainable from either the Illinois Soil Testing Service, 102 N. Broadway, Urbana, Illinois, or The Urbana Laboratories, 406 N. Lincoln, Urbana, Illinois.

January Sulphur Production Lower

The figures of the U. S. Bureau of Mines show that production of sulphur during January, 1949, totaled 416,678 long tons, a drop from the December output of 438,527 tons, but still above the 391,214 tons produced in January, 1948. Shipments from the mines dropped from 423,834 tons in December to 339,428 tons in January. This left stocks on hand at the mines, in transit and at producers warehouses amounting to 3,274,313 tons at the end of January, 1949.

Date Set For Connecticut Field Day

The annual Field Day of the Connecticut Agricultural Experiment Station will be held this year on August 24, according to an announcement recently made by Dr. James G. Horsfall, Director of the Station. The levent, open to all interested in agricultura research, will be held at the Station's Experimental Farm, Mt. Carmel.

This will be the only Field Day held during the next two years. In 1950, the Station will hold its 75th Anniversary Celebration and Field Day will be omitted from the Station's schedule for that year.

FEBRUARY TAG SALES

(Continued from page 14)

no change from the comparable 1948 figure.

The four Midwestern States—Indiana, Kentucky, Missouri and Kansas—reported sales totals during February considerably smaller than those in January—in line with the normal seasonal pattern in those States—but substantially higher than those of January 1948. Sales totaled 198,000 equivalent short tons during the month, an increase of roughly 11 per cent over the February 1948 volume. The January-February total of 461,000 tons was about 5 per cent higher than the corresponding figure for last year, with three of the four States reporting greater volume, and one, Indiana, reporting a decline of 16 per cent. Kentucky sales were up 25 per cent, totaling over 180,000 tons, while those of Missouri and Kansas rose in both cases by 10 per cent.

AMERICAN PLANT FOOD COUNCIL

(Continued from page 11)

June 19, in time for breakfast. The return trip will leave the Mount Washington on Wednesday evening, June 22, arriving in New York the next morning. Requests for reservations on this train should be sent to the offices of the American Plant Food Council, Barr Building, 910 17th St., N. W., Washington 6, D. C.

FERTILIZER PROGRESS IN BIZONAL GERMANY

(Continued from page 10)

geared to steel manufacture, this meant, of course, that the output of basic slag would also be drastically curtailed. Furthermore, it could mean a considerable reduction in the output of coke, a principal use of which is in the iron and steel industries, and in turn of coke-oven ammonia—another highly important fertilizer material in Germany.

In the summer of 1947 the Level of Industry Plan with respect to the United States–United Kingdom Zones was revised upward (*85*). For the Bizone, the revised plan for steel, basic chemicals, and synthetic ammonia is summarized as follows:

Commodity	Revised Level	Revised Level as % of: 1936 Production	Revised Level as % of: Existing Rated Capacity
Steel	[1] 10.7	72	56
Basic chemicals[2]	[3]270	105	98
Synthetic ammonia	[3] 95	124	100

[1]Million tons.
[2]Including nitrogen, phosphate, calcium carbide, sulfuric acid, and alkalis.
[3]Million Reichmarks measured in 1936 prices.

Compared with the original plan, the revised plan obviously is much more favorable to fertilizer production. Under this plan no further action was taken in connection with the prohibited industries. This part of the revised plan was left for future discussions among the occupational commanders. For the present, however, the plan continues to place the manufacture of synthetic ammonia —the Bizone's principal nitrogen fertilizer material—in the category of prohibited industries, although, as in the original plan, the existing capacity for production of synthetic ammonia will be retained until the necessary imports of nitrogen are available and can be paid for. Removal of the synthetic ammonia industry will then be in order.

In the meantime, so long as this situation remains it will hamper, perhaps seriously, the production of nitrogen fertilizers, for the simple reason that the industry management can hardly be expected to look with enthusiasm upon the large capital outlay necessary for rehabilitation of war-damaged plants that are destined for removal in the near future. Also, execution of the plan as it now relates to synthetic ammonia plants will have an adverse effect on the country's economy, at least to the extent that Germany will be forced to supplement her entirely inadequate productions of calcium cyanamide and by-product ammonia by imports of nitrogen fertilizers. Correspondingly, this will impair her ability to purchase from abroad greatly needed supplies of foodstuffs and industrial raw materials.

Assuming the revised level for phosphate fertilizer to be the same as that for the basic chemical group in which it is included, namely, 105 per cent of the estimated output in 1936, the permissible production would be only about 5 per cent more than the Bizone's estimated requirement of phosphate fertilizer (360,000 tons of P_2O_5) in the year ended June 30, 1948. Enforcement of the present plan would necessitate importation of phosphate to meet fully the requirements in subsequent years. This is not to say, however, that the Bizonal production of phosphate fertilizer will actually reach the permitted level within the next few years. In fact, the annual output may not amount even to 300,000 tons of P_2O_5 by 1950–1951, because the production of basic slag is still dependent on a low steel production and because of insufficient capacity for making other types of phosphate and probable shortages of sulfuric acid, soda ash, and other necessary chemicals.

Phosphate is included in the list of restricted products for the stated reason that it is important in manufacture of munitions. Certainly, this is true of elemental phosphorus which is an excellent material for fire and antipersonnel bombs and for smoke screens (*1, 2, 45, 71*) but which cannot be used directly as a fertilizer. On the other hand, none of the phosphate fertilizers themselves is of direct military importance. Furthermore, nearly all the phosphate fertilizer produced throughout the world is made by processes that do not involve the presence of elemental phosphorus in any stage of the operation. While strict limitation of phosphorus manufacture is justified under the Level of Industry Plan, there appears to be no logical reason for including production of phosphate fertilizers *per se* in the category of restricted industries.

Reparation and Dismantlement

There have been persistent, though unfounded, reports of the postwar dismantlement of facilities for the manufacture of fertilizers, fertilizer materials, and fertilizer chemicals (calcium carbide, soda ash, sulfuric acid, etc.) in the Bizone. Dismantlement or destruction of such facilities in the U. S.

Zones of Germany and Austria was categorically denied by the Secretary of War in a communication to the United States Senate Committee on Armed Services in April, 1947. Extensive inquiry in informed quarters has revealed no subsequent change in the picture. Likewise, the evidence appears equally conclusive as regards the situation in the British Zone. The question of the dismantlement and removal of all types of manufacturing plants from Germany is the subject of a resolution (*81*) introduced in the House of Representatives on November 24, 1947.

As of January 12, 1948, the list of reparations plants in the Bizone (*82*) included no plants or part plants for making fertilizers, fertilizer materials, or fertilizer chemicals as primary products. It did include, however, certain iron and steel plants making by-product phosphate fertilizer (basic slag), as well as plants for equipment and part equipment useful in the manufacture of fertilizers and related chemicals. In February, 1948 the technical press reported that a part plant for production of calcium carbide, Süddeutsche Kalkstickstoffwerke A. G., Trostberg, Bayern, would be considered for allocation as reparation. Apparently, this was in reference to a transformer at the Hart carbide plant, near Trostberg, which the Germans had removed from Italy during the war. The transformer has been returned to Italy and has been replaced by one from a German source.

French Zone Reparations

The French Zone reparations list (*83*), issued February 16, 1948, includes less than one complete unit (temporarily retained) for synthetic ammonia at the Oppau plant of I. G. Farbenindustrie A. G., as well as less than one complete unit for sulfuric acid and a part plant for calcium carbide at I. G.'s Ludwigshafen plant. On this basis, it may be concluded that no other facilities for fertilizers and fertilizer chemicals in the French Zone have been dismantled or are presently scheduled for dismantlement. Nevertheless, the statement appears in the popular press of July, 1948 that: "Most unbelievable is the dismantling of Europe's biggest nitrogen fertilizer plant, at Oppau, in the French Zone" (*4*). The same article very strongly implies that numerous fertilizer factories have been dismantled in the Bizone. As a matter of fact, the Oppau plant, though severely damaged during the war (*25*), is reliably reported to have produced some 75,000 tons of nitrogen as ammonia in the year ended June 30, 1948, about 55,000 tons of which was converted into fertilizers at Oppau. Rehabilitation of the plant, which was visited by the writers on April 2, 1948, to a daily capacity of 410 tons of nitrogen as ammonia is programmed.

Soviet Zone Reparations

Relatively little authentic information is available concerning dismantlement of fertilizer and fertilizer chemical factories in the Soviet Zone. It is reported, however, that extensive removal of plants for manufacture of calcium carbide, soda ash, and sulfuric acid has occurred. Although the dismantlement program is said to have included nitrogen-fixation facilities, there is positive evidence that the huge synthetic ammonia plant (Leuna works) at Merseburg and the calcium cyanamide plant at Piesteritz are still in at least partial operation. On the other hand, the large electric furnace phosphorus plant at Piesteritz (*7*, *48*, *54*, *55*, *58*, *64*), which formerly produced considerable phosphorus for conversion into fertilizers and which suffered little or no damage during the war, is definitely known to have disappeared. Aside from a small plant at Bitterfeld, Soviet Zone, the present status of which is unknown to the writers, the German production of elemental phosphorus was entirely at Piesteritz.

Production Handicaps

Shortage of coal has been a serious handicap to fertilizer production in the Bizone. The supply of this essential material is now, however, a limiting factor at relatively few plants, owing, among other things, to the assignment of high priority to coal for fertilizer manufacture.

Though high priority has been given to rail and water transportation of fertilizers and fertilizer raw materials, the shortage of cars and barges has delayed the movement of fertilizers from many plants, with the result that those having limited storage capacities have been forced at times either to shut down or to curtail production. As they are based on year-around operation of the plants, the programmed productions of fertilizers cannot be achieved unless the transportation for raw materials and especially finished products is commensurate with the day-to-day needs of the individual plants. Since the war, fertilizers have been moved to farms in the Bizone more or less steadily throughout the year. Continuation of this practice for an indefinite period of time is essential to full utilization of the fertilizer production facilities and of supplies of imported fertilizers.

(To be continued)

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Lion Oil Company, El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Spencer Chemical Co., Kansas City, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CONDITIONERS
Arkansas Rice Growers Corp. Assn., Stuttgart, Ark.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
Quaker Oats Company, Chicago, Ill.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

CYANAMID
American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.
Titlestad Corporation, Nicolay, New York City

FERTILIZER (Mixed) MANUFACTURERS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Southern States Phosphate & Fertilizer Co., Savannah, Ga
Virginia-Carolina Chemical Corp., Richmond, Va.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

FOUNDERS AND MACHINISTS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Machine Works, Aurora, Ind.

A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the Advertisers, see page 33

HOPPERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Southern States Phosphate & Fertilizer ., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES
American Agricultural Chemical Co., New York City

LEAD BURNERS
Southern Lead Burning Co., Atlanta, Ga.

LIMESTONE
American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

LOADERS—Car and Wagon
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Elevating and Conveying
Atlanta Utility Works, The, East Point, Ga.
Baughman Manufacturing Co., Jerseyville, Ill.
Hough Co., The Frank G., Libertyville, Ill.
Hayward Company, The, New York City
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Kent Mill Co., Brooklyn, N. Y.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Material Handling
Atlanta Utility Works, The, East Point, Ga.
Baughman Manufacturing Co., Jerseyville, Ill.
Hayward Company, The, New York City
Hough Co., The Frank G., Libertyville, Ill.
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Mixing, Screening and Bagging
Atlanta Utility Works, The, East Point, Ga.
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Superphosphate Manufacturing
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MANGANESE SULPHATE
McIver & Son, Alex. M., Charleston, S. C.

MINOR ELEMENTS
Tennessee Corporation, Atlanta, Ga.

MIXERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

NITRATE OF SODA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.

NITROGEN SOLUTIONS
Lion Oil Company, El Dorado, Ark.
Spencer Chemical Co., Kansas City, Mo.

NITROGENOUS ORGANIC MATERIAL
American Agriculture Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.

PHOSPHATE ROCK
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

PLANT CONSTRUCTION—Fertilizer and Acid
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Southern Lead Burning Co., Atlanta, Ga.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.
Titlestad Corporation, Nicolay, New York City

POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City

POTASH SALTS—Manufacturers
American Potash and Chem. Corp., New York City
Potash Co. of America, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
United States Potash Co., New York City

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

PYRITES—Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.

REPAIR PARTS AND CASTINGS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

BUYERS' GUIDE

Stedman's Foundry and Mach. Works, Aurora, Ind.

SCALES—Including Automatic Bagging
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SCREENS
Atlanta Utility Works, The, East Point, Ga.
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

SEPARATORS—Air
Kent Mill Co., Brooklyn, N. Y.
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Co., Boston, Mass.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SULPHATE OF AMMONIA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULPHUR
Ashcraft-Wilkinson Co., Atlanta, Ga.

SULPHURIC ACID
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, G.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davison Chemical Corporation, Baltimore, Md.
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

TAGS
Keener Mfg. Co., Lancaster, Pa.

TANKAGE
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

VALVES
Atlanta Utility Works, The, East Point, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

Alphabetical List of Advertisers

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2. Service . . . we make every effort to give you the service you want and deserve.

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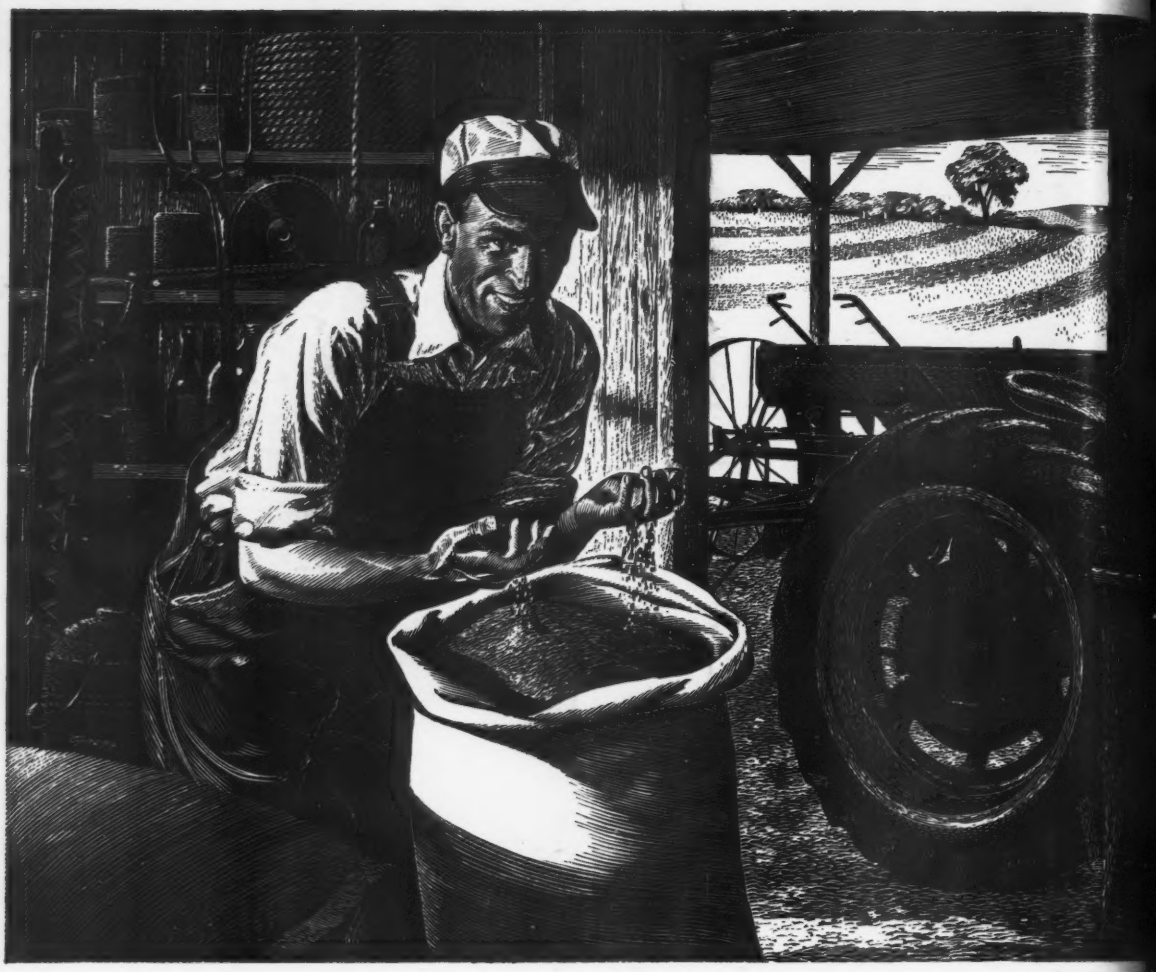
POTASH COMPANY OF AMERICA

CARLSBAD, NEW MEXICO

GENERAL SALES OFFICE . . 50 Broadway, New York, N. Y. • MIDWESTERN SALES OFFICE . . First National Bank Bldg., Peoria, Ill.
SOUTHERN SALES OFFICE . . Candler Building, Atlanta, Ga.



Why Farm Mechanization Increases Need for Magnesium in Mixed Fertilizers

Sul-Po-Mag

Water-Soluble
Double Sulfate of Potash-Magnesia

Magnesium deficiencies in the soil, appearing in unexpected places, may in some cases be the result of farm mechanization.

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By using *Sul-Po-Mag* in your fertilizers, you can help farmers to overcome magnesium deficiencies in their soils and increase the quality and yields of their crops.

SUL-PO-MAG (Water Soluble Double Sulfate of Potash-Magnesia) • MURIATE OF POTASH • SULFATE OF POTASH

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General Offices: 20 North Wacker Drive, Chicago